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- (71) Applicant (for all designated States except US):
HANYANG HAK WON CO., LTD. [KR/KR]; 17
Haengdang-dong Sungdong-gu, Seoul 133-791 (KR).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **ROH, Jeong-Jin**
[KR/KR]; 105-2005 Hyundai Apt., Bangbae-4-dong Seo-
cho-gu, Seoul 137-064 (KR). **PARK, Sung-Jin** [KR/KR];
105-903 Geukdong Apt., Hyunjeo-dong Seodaemoon-gu,
Seoul 120-796 (KR).
- (74) Agent: **C & S PATENT AND LAW OFFICE**; C-2306
Daelim Acrotel, 467-6 Dogok-dong Kangnam-gu, Seoul
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(54) Title: DIGITAL DC-DC CONVERTER USING DIGITAL MODULATION

(57) Abstract: A digital DC-DC converter is implemented using first-order delta-sigma modulation, rather than A/D conversion. In the DC-DC converter, a PWM generator 210 converts an input DC voltage to a preset level DC voltage according to an input PWM signal. A converter 220 converts the DC voltage from the PWM generator 210 to a preset level voltage. A delta-sigma modulator 230 converts a feedback voltage V_{fd} corresponding to the output voltage V_{out} of the converter 220 to a 1-bit digital voltage V_o according to a preset reference voltage V_{ref}. A counter 240 counts logic 1's in 1-bit digital voltage signals V_o from the delta-sigma modulator 230. A delay controller 250 controls a high-level delay time according to the number of logic 1's counted by the counter 240 and transfers a PWM signal having the controlled high-level delay time to the PWM generator 210.



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